

REMARKS/ARGUMENTS

This Amendment and the following remarks are intended to fully respond to the non-final Office Action dated January 27, 2010, hereinafter "Office Action." In that Office Action, claims 10-13 and 36-38 were examined, claims 36-38 were withdrawn, and claims 10-13 were rejected. Claims 10-13 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. Claim 10 was rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Sherbeck (U.S. Pat. No. 4,703,316; hereinafter "**Sherbeck**"). Claims 11-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherbeck in view of Casebolt (U.S. Pat. No. 5,355,149; hereinafter "**Casebolt**").

Reconsideration of these rejections, as they might apply to the original and amended claims in view of these remarks, is respectfully requested. In this Amendment, claim 10 has been amended, no claims have been canceled, and no claims have been added. Therefore, claims 10-13 remain present for examination.

Applicants submit that claim amendments are supported throughout the specification, and in the claims as originally filed, and do not introduce new matter. For instance, the amendments are supported by at least the following sections of the Specification:

In accordance with the invention, pairs of the most orthogonally overlapping zones, such as those shown in FIGS. 13a-13h, are selected by the controller 44 firmware and inspected for blocked light beam paths or lines that intersect. The pairs of triangles with beams that intersect at angles closer to 90 degrees are the pairs used for calculating the position of the touch. With reference to FIG. 14, the touch 70 lies entirely within horizontal zones 6 and 7 and vertical zone 8. Zones 6 and 8 form a more orthogonal pair of overlapping triangular zones than zones 7 and 8. Accordingly, the light beam paths or lines within these zones are examined for blockage. The location of the touch 70 is calculated using two intersecting lines 72, 74, one from each of the selected triangular zones. The intersecting lines 72, 74 selected for such calculation are those lines which are closest to perpendicular. Specification, para. 0115, as published.

The touchframe firmware optical noise immunity performs a "sanity check" on each input received by the controller 44 from an IrDA receiver 42 by comparing the actual input profile, i.e., the output profile of the IrDA receiver, with an expected input profile. There is a three-state logic applied. Each beam is treated as

being in one of three instantaneous states: Connected, Blocked, or Noise. A beam evaluated as Noise does not affect the state counter. A beam evaluated as Connected or Blocked moves the state counter in the direction of more connected or more blocked, up to a predetermined limit. This provides some hysteresis in transitions between Connected and Blocked states as seen by the next level of system firmware. Furthermore, as described in detail later, a state counter is used to "de-bounce" the beam state. Specification, para. 0058, as published.

With reference to FIG. 9, wherein the scale from left to right represents a time period of four microseconds subdivided into $\{ \text{fraction } (1/8) \}$ th microsecond intervals, each $\{ \text{fraction } (1/8) \}$ th microsecond the controller 44 fires one of the LEDs 24 in the array and then immediately begins to sample the output from the associated IrDA receiver 42. There is an aggregate delay that includes propagation delay from the controller 44 through the MUXing logic, time required to switch on the LED 24, time the IrDA receiver 42 takes to respond to the increase in light and time required for the output to propagate back to the controller. Finally the signal is logged internally by the controller 44. If, however, a signal is detected before an adequate amount of time has passed, the noise rejection algorithm assumes that some external source of light other than the LED 24 that was fired caused the IrDA receiver 42 to trigger. Waveforms of five example beams considered Noise, Good, or Blocked are illustrated. Specification, para. 0059, as published.

A beam is rejected as Noise if there is an output pulse edge present in the profile at a time earlier than is expected, i.e. earlier than the IrDA receiver 42 response time would allow. This time is noted as the "noise threshold." A beam is accepted as Connected only if the pulse edge occurs after the noise threshold and pulse width is a reasonable length. All other beams are considered Blocked. Specification, para. 0060, as published.

Claim Rejections under 35 U.S.C. § 112, first paragraph

Claims 10-13 were rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. Specifically, the Office Action states: "In regards to claim 10, the newly amended claim language teaches that 'the touch event lies completely within at least two zone pairs (lines 9-10).' However, there is no support for this in the original disclosure. ...In regards to claims 11-13, these claims are being rejected for being dependent upon improper claim 10." Office Action, pp. 4-5.

Without conceding the correctness of these rejections, the Applicants have amended claim 10 in the interest of forwarding the prosecution of this application to allowance. Claim 10 has been amended to recite in part:

...
the number and positioning of receivers being sufficient to form partially overlapping zone pairs such that the touch event lies ~~completely~~ entirely within at least two zone pairs, said method comprising:

Claim 10, supra, as amended.

Support exists for these amendments. See, e.g., Specification, para. 0115, as published.¹ In light of these amendments, the Applicants respectfully request the withdrawal of the § 112 rejection of claim 10. This claim is in condition for allowance. Because claims 11-13 depend on allowable base claim 10, these claims are also in condition for allowance. Allowance of claims 10-13 is therefore respectfully requested.

Claim Rejections under 35 U.S.C. § 102(b)

Claim 10 was rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Sherbeck. Applicants respectfully traverse this rejection because either the Examiner failed to state a *prima facie* case of anticipation or the current amendments to the claims now render the Examiner's arguments moot. "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." *Lindemann Maschinenfabrik GmbH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984); *see also*, MPEP § 2131. Applicants submit that the cited reference does not disclose all of the elements of the rejected claims.

Claim 10 of the present application, as amended, recites, *inter alia*:

...
monitoring each of the zone pairs for blockage of at least one light beam path,
wherein monitoring comprises: [[; and]]

¹ This citation to the Specification is offered by way of example only. Additional support exists. See Specification.

comparing the profile of the output to an expected profile having a time-based noise threshold;
identifying a light beam as noise if there is a pulse edge in the profile prior to the noise threshold;
identifying a light beam as connected if there is a pulse edge in the profile after the noise threshold; and
identifying all other light beams as blocked

...

In particular, Sherbeck fails to teach or suggest comparing the profile of the output to an expected profile having a time-based noise threshold, identifying a light beam as noise if there is a pulse edge in the profile prior to the noise threshold, identifying a light beam as connected if there is a pulse edge in the profile after the noise threshold, and identifying all other light beams as blocked, as recited in independent claim 10, as amended. Instead, Sherbeck discloses a touch panel input apparatus with arrays of light detectors synchronized to a reduced number of light sources. Sherbeck, col. 1, lines 36-66. Specifically, Sherbeck discloses triangular zones defined by a single light emitter (one of LEDs D0-D3) and an array of light detectors (one of arrays T_R and T_L). Sherbeck, col. 2, lines 22-37; Fig. 1.

As such, the systems and methods disclosed by Sherbeck are fundamentally different from the present systems. Specifically, Sherbeck fails to teach or describe, *inter alia*, comparing a profile to “*an expected profile having a time-based noise threshold*,” “*identifying a light beam as noise if there is a pulse edge prior to...the threshold*,” “*identifying a light beam as connected if there is a pulse edge in the profile after...the threshold*,” and “*identifying all other light beams as blocked*,” as recited in claim 10 (emphasis added). Although Sherbeck discloses a comparison of an analog-to-digital converter (ADC) with an ambient light source value, *see* Sherbeck, col. 3, lines 47-50 and col. 4, lines 6-9, Sherbeck completely fails to disclose any comparison of a profile to an expected profile “having a time-based noise threshold,” as recited by amended claim 10. Sherbeck also fails to provide any disclosure of identifying a light beam as “noise,” “connected” or “blocked” based upon identification of a pulse edge in a profiles, as recited by amended claim 10. As such, Sherbeck does not anticipate claim 10.

The dependent claims, *i.e.* claims 11-13, incorporate all of the limitations of the above independent claim, and are allowable over Sherbeck for at least the same reasons. As such, Applicants respectfully request that the Examiner withdraw the rejection and allow claims 10-13 at the Examiner's earliest convenience.

Claim Rejections Under § 103(a)

Claims 11-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherbeck in view of Casebolt. Applicants respectfully traverse the § 103(a) rejections because either the Examiner failed to state a *prima facie* case of obviousness or the current amendments to the claims now render the Examiner's arguments moot. To establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the references must teach or suggest all of the claimed limitations to one of ordinary skill in the art at the time the invention was made. M.P.E.P §§ 2142, 2143.03; *In re Royka*, 490 F.2d 981, 985 (C.C.P.A. 1974); *In re Wilson*, 424 F.2d 1382, 1385 (C.C.P.A. 1970). Applicants submit that Sherbeck fails to teach or suggest all of the claimed limitations and Casebolt fails to compensate for the deficiencies of Sherbeck.

Because claims 11-13 depend on allowable base claim 10, *see discussion supra*, these claims are also allowable over Sherbeck, and such action is respectfully requested. As such, any remaining arguments supporting the rejections of claims 11-13 are not acquiesced to even though they are not addressed herein. While the above discussion shows that the cited references fail to disclose each and every element of claim 10, amendments to claim 10 are made in the interest only of forwarding the prosecution of this application to allowance and are not necessarily made to address the Office Action's rejections based on the cited references. Amendments are therefore made without prejudice.

Further, the cited references fail to teach or suggest the following with respect to claims 10-13 and fail to cure the deficiencies of Sherbeck in view of Casebolt:

...

monitoring each of the zone pairs for blockage of at least one light beam path,
wherein monitoring comprises: [[; and]]
comparing the profile of the output to an expected profile having a time-
based noise threshold;

identifying a light beam as noise if there is a pulse edge in the profile prior to the noise threshold;
identifying a light beam as connected if there is a pulse edge in the profile after the noise threshold; and
identifying all other light beams as blocked

...

Claim 10, *supra* (as amended) (emphasis added) (upon which claims 11-13 depend).

Casebolt relates to a touch screen control system that is insensitive to ambient light interference. Casebolt, col. 2, lines 24-28. Specifically, Casebolt discloses programs (i.e., a “SCAN X-AXIS” subroutine and instructions related to a branch instruction set by a “VALID X TARGET FLAG”) to scan the light emitters and detectors positioned along an x-axis and a y-axis of a display screen. Casebolt, col. 9, line 52 – col. 10, line 5, and col. 10, lines 20-31. Casebolt further discloses determining a size of an object interrupting a light beam (*see* Casebolt, col. 10, lines 6-19) and determining that the object interrupting the light beam is “constantly depressed” (*see* Casebolt, col. 10, lines 32-46).

However, Casebolt fails to compensate for Sherbeck’s deficiencies. Specifically, Casebolt fails to teach or describe, *inter alia*, comparing a profile to “*an expected profile having a time-based noise threshold*,” “*identifying a light beam as noise if there is a pulse edge prior to...the threshold*,” “*identifying a light beam as connected if there is a pulse edge in the profile after...the threshold*,” and “*identifying all other light beams as blocked*,” as recited in claim 10 (emphasis added). Although Casebolt discloses “*examin[ing] a record of interrupted light beams*,” *see* Casebolt, col. 9, line 68 – col. 10, line 60, Casebolt completely fails to disclose any comparison of a profile to an expected profile “*having a time-based noise threshold*,” as recited by amended claim 10. Casebolt also fails to provide any disclosure of identifying a light beam as “noise,” “connected” or “blocked” based upon identification of a pulse edge in a profiles, as recited by amended claim 10. As such, Casebolt does not anticipate claim 10, nor does it render as obvious dependent claims 11-13.

Accordingly, the cited references, whether alone or in combination, fail to teach or suggest each and every one of the claim elements of claim 10. Because claims 11-13 depend on

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Reply to Office Action of January 27, 2010

allowable base claim 10, *see discussion supra*, these claims are also patentable over the cited references. Allowance of these claims is therefore respectfully requested.

CONCLUSION

This Amendment fully responds to the Office Action mailed on January 27, 2010. Still, that Office Action may contain arguments and rejections that are not directly addressed by this Amendment due to the fact that they are rendered moot in light of the preceding arguments in favor of patentability. Hence, failure of this Amendment to directly address an argument raised in the Office Action should not be taken as an indication that the Applicants believe the argument has merit. Furthermore, the claims of the present application may include other elements, not discussed in this Amendment, which are not shown, taught, or otherwise suggested by the references of record. Accordingly, the preceding arguments in favor of patentability are advanced without prejudice to other bases of patentability.

It is believed that no further fees are due with this Response. However, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment with respect to this patent application to deposit account number 13-2725.

In light of the above remarks and amendments, it is believed that the application is now in condition for allowance and such action is respectfully requested. Should any additional issues need to be resolved, the Examiner is requested to telephone the undersigned to attempt to resolve those issues.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(303) 357-1643



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/David St. John-Larkin/
David St. John-Larkin, Reg. No. 56,924